



SEQUENCE LISTING

<110> Neeper, Michael P.
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<120> SYNTHETIC HUMAN PAPILLOMAVIRUS GENES

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tgcgacagca ccctgcgcct gtgcgtgcag agcaccacag tggacatccg caccctggag 240
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<211> 297

<212> DNA

<213> Artificial Sequence

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<223> Codon-Optimized HPV6a E7

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<211> 129

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<211> 129

<212> DNA

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<210> 12

<211> 132

<212> DNA

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<210> 13

<211> 129

<212> DNA

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<211> 135

<212> DNA

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<223> Codon-Optimized HPV16 L1 fragment

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<210> 24

<211> 24
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 <211> 24
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 atctgcatcg ag 132

<210> 36
 <211> 131
 <212> DNA
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<220>
 <223> Codon-Optimized HPV16 E1 fragment

<400> 36
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 ggccttcagg c 131

<210> 37
 <211> 132
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Codon-Optimized HPV16 E1 fragment

<400> 37
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 ggcgggtgca gccagtacag cagcggcagc ggcggcgagg gcgtgagcga gcgccacacc 120
 atctgccaga cc 132

<210> 38
 <211> 135

<212> DNA
 <213> Artificial Sequence

<220>
 <223> Codon-Optimized HPV16 E1 fragment

<400> 38
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 catggcggcc ttggcgttgc tggctcttcag cacgttcagg atgttgggtca gaggggtctg 120
 gcagatggtg tggcg 135

<210> 39
 <211> 135
 <212> DNA
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<220>
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<400> 39
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 tacctgcaca tccag 135

<210> 40
 <211> 136
 <212> DNA
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<220>
 <223> Codon-Optimized HPV16 E1 fragment

<400> 40
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 gtgcaggtag aggcag 136

<210> 41
 <211> 132
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Codon-Optimized HPV16 E1 fragment

<400> 41
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 gccgccctgt actggtacaa gaccggcatc agcaacatca gcgaggtgta cggcgacacc 120
 cccgagtgga tc 132

<210> 42
 <211> 129
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Codon-Optimized HPV16 E1 fragment

<400> 42

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ggtgtcgcc                                     129

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<210> 43

<211> 129

<212> DNA

<213> Artificial Sequence

<220>

<223> Codon-Optimized HPV16 E1 fragment

<400> 43

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gtggacgaca gcgagatcgc ctacaagtac gccagctgg ccgacaccaa cagcaacgcc 60
agcgccttcc tgaagagcaa cagccaggcc aagatcgtga aggactgcgc caccatgtgc 120
cgccactac                                     129

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<210> 44

<211> 129

<212> DNA

<213> Artificial Sequence

<220>

<223> Codon-Optimized HPV16 E1 fragment

<400> 44

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gtacttgatc cactggctca tgctcatctg cttctttctg gcgcgcttgt agtggcggca 120
catggtggc                                     129

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<210> 45

<211> 129

<212> DNA

<213> Artificial Sequence

<220>

<223> Codon-Optimized HPV16 E1 fragment

<400> 45

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accgacaag                                     129

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<210> 46

<211> 130

<212> DNA

<213> Artificial Sequence

<220>

<223> Codon-Optimized HPV16 E1 fragment

<400> 46
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 ggcggcgcgg 130

<210> 47
 <211> 129
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Codon-Optimized HPV16 E1 fragment

<400> 47
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 gacgacaacc tgcgcaacgc cctggacggc aacctggtga gcatggacgt gaagcaccgc 120
 cccctggtg 129

<210> 48
 <211> 132
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Codon-Optimized HPV16 E1 fragment

<400> 48
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 gcggtgcttc ac 132

<210> 49
 <211> 126
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Codon-Optimized HPV16 E1 fragment

<400> 49
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 aacgacaaga actggaagag cttcttcagc cgcacctgga gccgcctgag cctgcacgag 120
 gacgag 126

<210> 50
 <211> 105
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Codon-Optimized HPV16 E1 fragment

<400> 50
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<210> 51
<211> 23
<212> DNA
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<220>
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<210> 52
<211> 23
<212> DNA
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<220>
<223> Codon-Optimized HPV16 E1 fragment

<400> 52
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<210> 53
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Codon-Optimized HPV16 E1 fragment

<400> 53
gagctgggtgc gccccttcaa g                21

<210> 54
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Codon-Optimized HPV16 E1 fragment

<400> 54
cttgaagggg cgcaccagct c                21

<210> 55
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Codon-Optimized HPV16 E1 fragment

<400> 55
ctgctgtgcg tgagcccat g                21

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<210> 56
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Codon-Optimized HPV16 E1 fragment

<400> 56
catggggctc acgcacagca g 21

<210> 57
<211> 21
<212> DNA
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<220>
<223> Codon-Optimized HPV16 E1 fragment

<400> 57
gccaccatgt gccgccacta c 21

<210> 58
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Codon-Optimized HPV16 E1 fragment

<400> 58
gtagtggcgg cacatggtgg c 21

<210> 59
<211> 21
<212> DNA
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<220>
<223> Codon-Optimized HPV16 E1 fragment

<400> 59
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<210> 60
<211> 21
<212> DNA
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<220>
<223> Codon-Optimized HPV16 E1 fragment

<400> 60
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<210> 61
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 <212> DNA
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 <220>
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 <400> 61
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 <210> 62
 <211> 24
 <212> DNA
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 <223> Codon-Optimized HPV16 E1 fragment

 <400> 62
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 <210> 63
 <211> 25
 <212> DNA
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 <223> Codon-Optimized HPV16 E1 fragment

 <400> 63
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 <210> 64
 <211> 38
 <212> DNA
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 <223> Codon-Optimized HPV16 E1 fragment

 <400> 64
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 <210> 65
 <211> 99
 <212> DNA
 <213> Artificial Sequence

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 <223> Codon-Optimized HPV16 E2 fragment

 <400> 65
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aacgacagca ccgacctgcg cgaccacatc gactactgg          99

<210> 66
<211> 104
<212> DNA
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<220>
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<400> 66
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gcagctgacc ctggagacga tctacaacag ccagtacagc aacg          104

<210> 67
<211> 108
<212> DNA
<213> Artificial Sequence

<220>
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<400> 67
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acaccatgca ctacaccaac tggaccaca tttacatctg tgaggagg          108

<210> 68
<211> 104
<212> DNA
<213> Artificial Sequence

<220>
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<400> 68
cgtgcacgag gggatccgca cctacttcgt gcagttcaag gacgacgccg agaagtacag 60
caagaacaag gtgtgggagg tgcacgccgg aggccaggtg atcc          104

<210> 69
<211> 110
<212> DNA
<213> Artificial Sequence

<220>
<223> Codon-Optimized HPV16 E2 fragment

<400> 69
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gaccacaatc cagcgccctc gcagcgagcc cgacaccggc aacccttgcc          110

<210> 70
<211> 107
<212> DNA
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<220>

<223> Codon-Optimized HPV16 E2 fragment

<400> 70

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<210> 71

<211> 113

<212> DNA

<213> Artificial Sequence

<220>

<223> Codon-Optimized HPV16 E2 fragment

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<210> 72

<211> 101

<212> DNA

<213> Artificial Sequence

<220>

<223> Codon-Optimized HPV16 E2 fragment

<400> 72

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<210> 73

<211> 98

<212> DNA

<213> Artificial Sequence

<220>

<223> Codon-Optimized HPV16 E2 fragment

<400> 73

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<210> 74

<211> 110

<212> DNA

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<220>

<223> Codon-Optimized HPV16 E2 fragment

<400> 74

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<210> 75
 <211> 111
 <212> DNA
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<220>
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<400> 75
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<210> 76
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<220>
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<210> 77
 <211> 111
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<210> 78
 <211> 50
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<220>
 <223> Codon-Optimized HPV16 E2 fragment

<400> 78
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<210> 79
 <211> 45
 <212> DNA
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<220>
 <223> Codon-Optimized HPV16 E2 fragment

<400> 79
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<210> 80
<211> 21
<212> DNA
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<220>
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<400> 80
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<210> 81
<211> 19
<212> DNA
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<400> 81
ggccaaccac agcgccgcc 19

<210> 82
<211> 21
<212> DNA
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<400> 82
gccgtgcttc ttgatgcagc c 21

<210> 83
<211> 17
<212> DNA
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<220>
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<400> 83
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<210> 84
<211> 22
<212> DNA
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<400> 84
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 <210> 85
 <211> 109
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Codon-Optimized HPV16 E7 fragment

 <400> 85
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 <210> 86
 <211> 106
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Codon-Optimized HPV16 E7 fragment

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 ctgcgcctgt gcgtgcagag caccacgctc gacatccgca ccctgg 106

 <210> 87
 <211> 96
 <212> DNA
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 <220>
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 <210> 88
 <211> 106
 <212> DNA
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 <220>
 <223> Codon-Optimized HPV16 E7 fragment

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 <210> 89
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<220>
<223> Codon-Optimized HPV16 E7 fragment

<400> 89
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<210> 90
<211> 20
<212> DNA
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<220>
<223> Codon-Optimized HPV16 E7 fragment

<400> 90
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<210> 91
<211> 105
<212> DNA
<213> Artificial Sequence

<220>
<223> Codon-Optimized HPV6a E7 fragment

<400> 91
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gtgctggacc tgcagcctcc cgaccccggtg ggcttgcaact gctac 105

<210> 92
<211> 105
<212> DNA
<213> Artificial Sequence

<220>
<223> Codon-Optimized HPV6a E7 fragment

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gctgctgtcc accagctgct cgtagcagtg caggcccacg gggtc 105

<210> 93
<211> 107
<212> DNA
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<220>
<223> Codon-Optimized HPV6a E7 fragment

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gcgcttggtg gtgcagtgc cagagaccga catccgcgag gtgcagc 107

<210> 94

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<211> 102
 <212> DNA
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 <220>
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 <210> 95
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 <220>
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 <400> 95
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 <210> 96
 <211> 26
 <212> DNA
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 <220>
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 <400> 96
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 <210> 97
 <211> 109
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Codon-Optimized HPV18 E7 fragment

 <400> 97
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 <210> 98
 <211> 111
 <212> DNA
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 <220>
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<210> 99
 <211> 108
 <212> DNA
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<220>
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<400> 99
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<210> 100
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<220>
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<210> 101
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<210> 102
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<400> 102
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<210> 103
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<210> 104
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<210> 105
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<220>
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<210> 106
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<210> 107
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<210> 111

<211> 94

<212> DNA

<213> Artificial Sequence

<220>

<223> Codon-Optimized HPV6 E2 fragment

<400> 111

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<210> 112

<211> 97

<212> DNA

<213> Artificial Sequence

<220>

<223> Codon-Optimized HPV6 E2 fragment

<400> 112

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<210> 113
 <211> 97
 <212> DNA
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<220>
 <223> Codon-Optimized HPV6 E2 fragment

<400> 113
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 cgccctgtgc gtggcccaca tcggccccgt ggacagc 97

<210> 114
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<220>
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<400> 114
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 gtggttgccg ctgtccacgg ggccgatgtg ggcc 94

<210> 115
 <211> 95
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<220>
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<400> 115
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 cctgaagtgc ttccgctacc gctgaacga tcgcc 95

<210> 116
 <211> 96
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<220>
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<400> 116
 cgtgcttgtg gggagccttg ctgctggccc agtgccaggt gctgctgac aggtcgaaca 60
 ggtggcggtg gcgatcggtc aggcggtagc ggaagc 96

<210> 117
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<220>
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<400> 117
gcagcaaggc tccccacaag cagccatcg tgaccgtgac ctacgacagc gaggagcagc 60
gccagcagtt cctggacgtg gtgaagatcc ctccc                               95

<210> 118
<211> 96
<212> DNA
<213> Artificial Sequence

<220>
<223> Codon-Optimized HPV6 E2 fragment

<400> 118
ctcgagagat ctcccgggtc tagagcttac agcaggtgca ggctcatgaa gccagcttg 60
tggctgatgg tgggagggat cttcaccagc tccagg                               96

<210> 119
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<220>
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<400> 119
gaattcagat ctgatatcac catgg                                           25

<210> 120
<211> 21
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<400> 120
gcagggtcca gggctccatg c                                               21

<210> 121
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<400> 121
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<210> 122
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<212> DNA
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<400> 122
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25

<210> 123
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<400> 123
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21

<210> 124
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<400> 124
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23

<210> 125
 <211> 22
 <212> DNA
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<400> 125
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22

<210> 126
 <211> 26
 <212> DNA
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<400> 126
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26

<210> 127
 <211> 97

<212> DNA
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<400> 127
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<210> 128
 <211> 98
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<210> 129
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 ccaggtggtg cccgcctaca acatcagcaa gagc 94

<210> 130
 <211> 94
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<210> 131
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<400> 131

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<211> 92
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<400> 134
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tagtacaggc cgcggtggct caccgaggtg gc 92

<210> 135
<211> 94
<212> DNA
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caacaacgtg atcgactgca acgacagcat gtgc 94

<210> 136
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<223> Codon-Optimized HPV18 E2 fragment

<400> 136

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<211> 93

<212> DNA

<213> Artificial Sequence

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<223> Codon-Optimized HPV18 E2 fragment

<400> 137

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<210> 138

<211> 96

<212> DNA

<213> Artificial Sequence

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<210> 139

<211> 97

<212> DNA

<213> Artificial Sequence

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<223> Codon-Optimized HPV18 E2 fragment

<400> 139

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<211> 97

<212> DNA

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<210> 141
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<210> 142
<211> 98
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<210> 143
<211> 25
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<400> 143
gaattcagat ctgatatcac catgc 25

<210> 144
<211> 23
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<400> 144
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<210> 145
<211> 21
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<400> 145
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<210> 146
<211> 21
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<400> 146
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<210> 147
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<400> 147
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<400> 148
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<210> 149
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<400> 149
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<210> 150
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20413YCA

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26